CLAIMS

1. A plasma display panel manufacturing method comprising:

a phosphor layer forming step for forming phosphor layers on at least one of: a main surface of a front panel facing a back panel; and a main surface of the back panel facing the front panel;

a sealant layer forming step for forming a sealant layer on at least one of : a peripheral region of the main surface of the front panel facing the back panel; and a peripheral region of the main surface of the back panel facing the front panel; and

a sealing step for sealing, following the phosphor layer forming step and the sealant layer forming step, the front panel and the back panel that have been placed facing each other so that an inner space is surrounded by the sealant layer, by heating the sealant layer to a temperature that is equal to or higher than a softening point of the sealant layer so as to soften the sealant layer,

wherein when the sealant layer is formed in the sealant layer forming step, a shape of the sealant layer is set so as to provide at least one gap between the peripheral regions of the front panel and the back panel when the front panel and the back panel are placed facing each other, the at least one gap allowing gas to pass between the inner space between the

panels that is surrounded by the sealant layer and an outside of the panels.

2. The plasma display panel manufacturing method of Claim 1, wherein

in the sealant layer forming step, the sealant layer is formed with either a protrusion or a depression in at least one part of the sealant layer formed on the at least one of the peripheral regions of the panels.

3. The plasma display panel manufacturing method of Claim 2, wherein

a height of the protrusion or a depth of the depression formed in the sealant layer in the sealant layer forming step is 300 μm or more.

4. The plasma display panel manufacturing method of Claim 2, wherein

the sealant layer is formed in the sealant layer forming step so that the part of the sealant layer in which the protrusion is provided is narrower than other parts of the sealant layer.

5. The plasma display panel manufacturing method of Claim 2, wherein

the sealant layer is formed in the sealant layer forming step so that the part of the sealant layer in which the depression is provided is wider than other parts of the sealant layer.

6. The plasma display panel manufacturing method of Claim 1, wherein

in the sealant layer forming step, the sealant layer is formed around one of the peripheral regions of the facing main surfaces of the front panel and the back panel, and

the sealant layer is formed on at least one part of the other one of the peripheral regions of the facing main surfaces of the front panel and the back panel.

7. The plasma display panel manufacturing method of Claim 6, wherein

a thickness of the sealant layer formed on the other one of the peripheral regions of the facing main surfaces of the front panel and the back panel is 300 μm or more.

8. The plasma display panel manufacturing method of Claim 1, wherein

the sealant layer is formed in the sealant layer forming step so that a part of the sealant layer in which the at least one gap is provided is wider than other parts of the

sealant layer.

9. The plasma display panel manufacturing method of Claim 1, further comprising,

a partition forming step for forming partitions respectively along an outer edge and an inner edge of a region where the sealant layer is formed on the at least one of the peripheral regions of the facing main surfaces of the front panel and the back panel.

10. The plasma display panel manufacturing method of Claim 1, wherein

a softening point of the sealant layer formed in the sealant layer forming step is 410℃ or higher.

11. The plasma display panel manufacturing method of Claim 1, wherein

a difference between a highest temperature at which the panels are heated in the sealing step and a softening point of the sealant layer is 40℃ or less.

12. The plasma display panel manufacturing method of Claim 1, wherein

when the sealant layer is heated in the sealing step, the sealant layer is heated at a temperature no lower than

250℃ but below the softening point of the sealant layer for at least 10 minutes, and then is heated to a temperature of the softening point or higher.

13. The plasma display panel manufacturing method of Claim 1, wherein

the sealant layer formed in the sealant layer forming step includes a glass with a low melting point.

14. The plasma display panel manufacturing method of Claim 1, wherein

the sealing step is performed in a dry gas atmosphere.

15. The plasma display panel manufacturing method of Claim 14, wherein

the dry gas includes oxygen.

16. The plasma display panel manufacturing method of Claim 15, wherein

the dry gas is dry air.

17. The plasma display panel manufacturing method of Claim 14, wherein

a partial pressure of steam included in the dry gas atmosphere is 130Pa or lower.

18. The plasma display panel manufacturing method of Claim 1, wherein

the phosphor layers formed in the phosphor layer forming step include a blue phosphor layer composed of $BaMgAl_{10}O_{17}$: Eu.

19. A plasma display panel that is manufactured using the plasma display panel manufacturing method of any of Claims 1 to 18.

20. A plasma display panel that is manufactured using the plasma display panel manufacturing method of any of Claims 1 to 18, and that includes a plurality of cells in each of which a blue phosphor layer is formed, wherein

a chromaticity coordinate *y* in the CIE color specification of luminescent color of light emitted from the cells in each of which the blue phosphor layer is formed when light is emitted from only the cells is 0.08 or lower.

21. A plasma display panel that is manufactured using the plasma display panel manufacturing method of any of Claims 1 to 18, and that includes a plurality of cells in each of which a blue phosphor layer is formed, wherein

a peak wavelength of a spectrum of light emitted from

the cells in each of which the blue phosphor layer is formed when light is emitted from only the cells is 455nm or shorter.

22. A plasma display panel that is manufactured using the plasma display panel manufacturing method of any of Claims 1 to 18, and that includes a plurality of cells, wherein

a color temperature of luminescent color of light emitted from the cells when light is emitted from all the cells under the same power condition is 9000K or higher.

23. A plasma display panel that is manufactured using the plasma display panel manufacturing method of any of Claims 1 to 18, and that includes a plurality of cells in which phosphor layers including a blue phosphor layer and a green phosphor layer are formed, wherein

a ratio of a peak intensity of a spectrum of light emitted from the cells in each of which the blue phosphor layer is formed to a peak intensity of a spectrum of light emitted from the cells in each of which the green phosphor layer is formed, when light is emitted, under the same condition, from the cells in each of which one of the blue phosphor layer and the green phosphor layer is formed is 0.8 or higher.

24. A plasma display panel that is manufactured using the

plasma display panel manufacturing method of Claim 18, and that includes a plurality of cells in each of which a blue phosphor layer is formed, wherein a ratio of c-axis length to a-axis length of $BaMgAl_{10}O_{17}$: Eu is 4.0218 or smaller.

25. A plasma display panel that is manufactured using the plasma display panel manufacturing method of Claim 18, and that includes a plurality of cells in each of which a blue phosphor layer is formed, wherein

when $BaMgAl_{10}O_{17}$:Eu is analyzed with a thermal desorption analysis method, a peak value in the number of molecules contained in H_2O desorbed from $BaMgAl_{10}O_{17}$:Eu at 200℃ or higher is 1×10^{16}/g or smaller.

26. An image display apparatus that includes a plasma display panel manufactured using the plasma display panel manufacturing method of any of Claims 1 to 18, and a driving circuit.

27. A plasma display panel sealing apparatus for sealing a front panel and a back panel that have been placed facing each other with a sealant layer between outer regions of the panels, by heating the panels and the sealant layer, comprising,

a gas circulating unit for circulating heating gas from

sides of the panels to an inner space between the panels.